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EXAMINER	
MCCURDY, JOSHUA D	

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/507,379	YLITALO, JARI	
	Examiner	Art Unit	
	Joshua D. McCurdy	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-22 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 21 September 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Alexanderson (1,481,853).

- With respect to claim 1, Alexanderson teaches an electric ship propulsion system that comprises a plurality of propellers driven by one or more motors (Page 1, lines 9-13). Alexanderson's invention is designed to satisfy the requirements that he determined experimentally, and sets forth on page 1 of his specification (lines 54-84), for bringing a ship and ship propeller motor to a standstill, then reversing, using one of several different methods of electrically braking propellers, for the purpose of quick maneuvering of the ship. The preferred embodiment is to electrically brake propellers by shorting together in reverse phase rotation the windings of multiple synchronous propeller motors in his system so that they operate as induction motors (Page 1, lines 101-108; Page 2, lines 1-10); operating as such, these motors are considered magnetizing devices. Further regarding present claim 1, this system brings propeller motors to standstill and then accelerates them back to synchronous

operation, either in forward or reverse phase rotation, with their electric power network that comprises a generator and turbine, is a frequency conversion system, or frequency converter (Page 2, lines 10-23). In reference to Figures 1 and 3, stator windings 4 and 4' of the two propeller motors can be shorted together with the stator winding of the generator, using the switch network as shown (described on Page 2, lines 42-50), or shorted together after disconnection from the generator and power network (Page 3, lines 76-100).

- Claim 2 is anticipated by Alexanderson for the reasons given for claim 1, wherein quick maneuvering of the ship establishes the need for braking and reversing a propeller, which is preceded by disconnection of the propeller motor stator windings 4 and 4' from the generator using disconnecting switch 12 (Page 2, lines 48-50). Alexanderson further specifies that shorting the propeller windings 4 and 4' to generate braking torque follows opening disconnecting switch 12 and reversing contactors 7-11 (Page 3, lines 82-88); even in the case when the propeller motor stator windings are shorted to the stator of the generator, manipulation of line contactors 7-11 is performed while the circuits are dead, to well-known advantage in the art (Page 3, lines 1-4).
- Claim 3 is rejected on the basis of references given for claims 1 and 2, above, while further noting that switching a propeller motor into a short-circuit occurs within the frequency converter, as it provides the mechanism by which the

motor frequency is reduced to zero, at standstill, as necessary to effect the maneuvering demands of the ship.

- Claim 4 is anticipated by Alexanderson because he specifies that the switches and switch networks on which his invention relies are limited only to "switching means" (Claim 5), which includes semiconductor switches. The only other reference to switching means is inclusive of semiconductors (Page 3, lines 27-36), wherein a practical embodiment of the invention the circuit-controlling switches will preferably be remotely controlled through an electric controller.
- Claim 5 is anticipated by Alexanderson because of the scenario in which a motor, generator, and turbine are first operating synchronously, with balanced, 3-phase excitation defined relative to a neutral potential, then the stator windings of a generator are shorted to the stator windings of a propeller motor (as above, regarding claims 1 and 2), thereby bringing every terminal of the motor windings to a neutral potential (Figures 1-3; Page 2, lines 24-58). The field windings of a propeller motor (one or more motors) can also be connected to the generator in reverse phase rotation, with the forward and reverse 3-phase voltages defined relative to neutral potentials (Page 2, lines 100-130). The neutral potential of the generator is considered to be the equipment ground potential, as per the present claim.
- Claim 6 is rejected for reasons given with regard to claim 1, whereby the frequency converter comprises a switch network that is necessary for

reducing propeller, and propeller motor, speed to zero and back into synchronicity; the means for controlling these switches are therefore an inherent component of the frequency conversion system (Page 2, lines 4-48; Page 2, lines 100-130; Page 3, lines 76-100). Alexanderson further teaches that in a practical embodiment of the invention, the circuit controlling the switches and contactors will be remotely controlled, meaning that the switch-control circuit is not in a remote location relative to the switches; i.e., it is in close proximity to the switches (Page 3, lines 27-36).

- Claim 7 is anticipated by Alexanderson, as with regard to claim 1, because his invention uses a propeller-driving motor that operates, under normal conditions, in synchronicity with an electric generator and turbine (Page 1, lines 14-21). Although one or more motors function as induction motors during propeller braking and reversing, normal synchronous operation is subsequently reestablished immediately thereafter, either with forward or reverse phase rotation (Page 2, lines 14-23; Page 2, lines 35-41; Page 3, lines 46-51).
- Claim 8 is rejected for the reasons given to support rejection of claim 1, whereby Alexanderson teaches a system for electric braking of propeller motors by switching multiple motors into short-circuit conditions, including the embodiment shown in Figure 2 in which the stator windings of a propeller-driving motor are shorted together with the stator windings of a generator, thus being comprised by an even broader propulsion system, or unit, than

falls within the interpreted scope of the present claim regarding propulsion units (Page 1, lines 94-108; Page 2, lines 24-68; Page 2, lines 100-130).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 9-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geil et al (6,592,412), in light of Alexanderson (1,481,853).

- With respect to claim 9, Geil et al teach a drive and propulsion system for ships having a propeller assembly with an electric motor for propulsion that is a permanent-magnet synchronous machines (Col. 1, lines 58-67; Col. 2, lines 1-4; Col. 2, lines 14-50; Col. 14, lines 9-12). Geil et al teach a propeller motor that turns about a vertical, or azimuth, axis to function as a steering propeller to steer a ship (Col. 1, lines 8-21); two identical steering propeller units are further taught, each with autonomous control so that maneuverability of the ship is maintained if one unit, or module, fails and is consequently de-energized (Col. 2, lines 8-13). In anticipation of a frequency converter, Geil et al teach a direct converter that varies the rotation speed of the drive motor and connects to the on-board power supply network on its input side via three 3-winding transformers; these transformers each have magnetizing

inductance associated therewith (with variable excitation) and therefore are considered magnetization devices (Col. 2, lines 28-47; Col. 14, lines 21-24). The direct converter takes 3-phase AC from the stator winding of a synchronous machine and outputs an AC waveform at a different, but specific, frequency, voltage, and number of phases (Col. 4, lines 65-67 to col. 5, lines 1-9; col. 9, lines 11-28; col. 11, lines 59-67 to col. 12, lines 1-2; col. 14, lines 13-24). This direct converter, or frequency converter, interconnects with a stator winding of a motor and together they constitute a 3-phase synchronous motor that is driven by, or operated from, the ship's on-board power supply network (Col. 2, lines 14-24). The converter is network-controlled and it comprises three power semiconductors, switchgear assemblies for the power supply network (as per claim 9), and additional control and regulation devices (Col. 14, lines 40-67). Geil et al further teach that two of the same propeller-driving systems as just described operate in parallel with master/slave control of rotation speed (Col. 15, lines 1-16); the master system can disconnect the parallel slave system from the power supply network and, further, switch-out the converter from its associated propeller drive motor on the output side (Col. 15, lines 17-27). A short-circuit in one of these two parallel motor subsystems cause that subsystem to be disconnected and then grounded, thereby forcing stator winding voltages to zero and discharging energy stored therein; the fact that grounding renders

the motor and its windings safe for hands-on maintenance also indicates that the stator winding has been shorted to grounded (Col. 15, lines 17-27).

- With respect to claims 10 and 11, Geil et al teaches that propeller motor units can be disconnected from the electrical power network in response to a short-circuit fault.
- With respect to claims 10 and 11, however, Geil et al do not intentionally short-circuit the stator windings of one or more propulsion motors, nor do they disconnect the motor(s) from the power supply network prior to switching into a short-circuit condition. Instead, the stator windings of the motor are disconnected and then grounded in response to a short-circuit fault.
- With respect to claims 10 and 11, Alexanderson teaches the above limitations that Geil et al lack, as detailed in regard to claims 1 and 2 (above), whereby ship maneuvering establishes a need for braking multiple motor units and consequently the motor windings are disconnected from one or more generators of the power supply network (Col. 1, lines 101-108; col. 2, lines 10-23; col. 2, lines 42-50). The stator windings of the motors are then either shorted individually, two motors are shorted together, or two motors are shorted together with the generator stator winding (Col. 3, lines 1-4; col. 3, lines 76-100). Furthermore, the limitation that is unique to claim 11, regarding switching into a short within a frequency converter, is satisfied by Alexanderson's invention because the short-circuiting switches provide the basic means for motor frequency control and conversion.

- Claims 10 and 11 are fully anticipated by Alexanderson, except for their dependence on claim 9, regarding which Alexenderson lacks the turning arrangement for the propeller motors, to which Geil et al refer as steering propellers; instead, the Alexanderson teaches conventional propeller arrangements that are fixed with respect to the ship.
- With respect to claims 10 and 11, motivation to modify Geil et al in light of Alexanderson is to effect rapid braking and reversing of a ship's propeller-driving motors as necessary for quick maneuvering of the ship.
- Therefore, it would be obvious to one of ordinary skill in the art that Geil et al can be modified in light of Alexanderson so that the steering propellers and propeller motors of Geil et al can be rapidly braked and reversed in the manner taught by Alexanderson.
- With respect to claim 12, the switchgear in the direct converter, or frequency converter, of Geil et al comprises power semiconductors that, by one of ordinary skill in the art, would be the conventional choice for switching means to effect a short-circuit condition, as taught by the modified invention of Geil et al and detailed above with regard to claims 9-11. As with respect to claim 4, the switch network of Alexanderson can be implemented using any appropriate means, preferably with electric control of the switches, and therefore it would be obvious to one of ordinary skill in the art to use conventional semiconductors switches, as per claim 12.

- Claim 13 is anticipated by Alexanderson for the same reasons given for rejection of present claim 5 (above).
- Claim 14 is anticipated by Alexanderson for the same reasons given for rejection of present claim 6 (above).
- Claim 15 is anticipated by Geil et al whereby the propeller-driving motors therein are configured in the form of a permanent magnet-excited synchronous machine (Abstract; Col. 1, lines 58-67 to col. 2, lines 1-3).
- Claim 16 is anticipated by Alexanderson, as detailed with regard to present claim 1, whereby the stator windings of two propeller-driving motors are shorted together for synchronous electric braking (Page 3, lines 76-106).
- Claim 17 is anticipated by Alexanderson for reasons detailed with regard to present claim 1.
- Claim 18 is anticipated by Geil et al because elevated current in a motor winding trips a breaker before it can rise to the level of a short-circuit current. As defined by an elevated or non-normal current magnitude, a short-circuit condition cannot be effected until after the motor is disconnected from the power system (as for claim 9, above). The circuit breaker thus performs an automatic check on the motor so that a short-circuit current, i.e. the embodiment of a short-circuit condition, is always preceded by disconnection from the power supply network.
- Claim 19 is anticipated by Alexanderson for reasons given with regard to claim 16.

- Claim 20 is anticipated by Alexanderson for reasons given to support rejection of claim 9.
- Claim 21 is anticipated by Alexanderson for reasons given to support rejection of present claim 18 (above).
- Claim 22 is anticipated by Alexanderson for reasons given to support rejection of claims 1 and 16.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua D. McCurdy whose telephone number is 571 272 5923. The examiner can normally be reached on 8-530.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David S. Martin can be reached on 571 272 2107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joshua McCurdy
EXAMINER

September 22, 2005

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